A replacement Abstract is appended hereto, properly recast as a single paragraph and without legal language. Approval is requested.

Remarks

Reconsideration of the application is requested in view of the attachments hereto and comments which follow.

Turning first to the claim objections, the claims of the application are attached, having proper spacing between all claims. The inadvertent run on of claims 2 and 8 to their prior claims is regretted, and everything is properly set forth in the replacement claim set which is appended hereto, and which, other than having the claims properly spaced, has no change whatsoever to the claim language.

Turning next to the specification, since there appears to have been an objection to the Abstract, the Abstract has been recast and is appended hereto.

The Examiner has rejected Claims 1, 3, 4, 7 to 11, 17 to 25, 29 to 33 and 39 to 44, under 35 U.S.C.102 (e) as being anticipated by Smith (US6,222,823). Reconsideration of the rejection is requested, in light of the comments below in which it is submitted that the claims have not been anticipated by Smith.

The present application relates to an integrated connection admission control (CAC) and bandwidth on demand control (BoD) system, and method of integration of a CAC and BoD, for allocating the resource of a common medium uplink of a multiple access (MA) asynchronous network segment. The CAC comprises means for allocating static resource to all virtual connections (VCs) accepted by the CAC and means for booking dynamic resource to the VCs, or groupings of VCs, that require guaranteed dynamic resource. The BoD comprises means for allocating dynamic resource to VCs, or to groupings of VCs, requesting dynamic resource such

that all VCs or groupings of VCs requesting dynamic resource are dynamically allocated requested dynamic resource up to at least the guaranteed dynamic resource which has been booked for them by their CAC.

A key feature of this invention is having at least a proportion of the dynamic resource prebooked by the CAC, enabling the common medium uplink to deliver quality of service (QoS) to subscribers by ensuring that each VC (or group of VCs) will always receive the minimum resource it needs. In particular, by not allocating the booked resource statically and instead allowing the BoD to allocate the booked resource dynamically, any prebooked dynamic resource that is not needed by a VC or a group of VCs, can be reallocated dynamically as extra resource to any other VCs or groups of VCs, within the shared medium uplink, that may require more of the resource.

This advantageously provides flexibility within the communications system to provide desired quality of service (QoS). For example, as described on page 6, line 28, in setting up a VC the CAC is able to reserve static resource for the duration of the connection associated with the VC. The CAC, is also able to provide booked dynamic resource during transmission, after a VC has been set up. Alternatively, the CAC, is able to reserve static resource and booked dynamic resource to a group of VCs within the same subscriber access unit (SAU) and also change the amount of static resource and/or booked dynamic resource allocated to a set up VC, when new connections are set up or when connections are released within the group.

Smith in no way teaches integration of a CAC and BoD, wherein the CAC comprises means for booking dynamic resource to VCs. Further, Smith is silent in relation to two different types of bandwidth resource, namely static and dynamic. Furthermore, Smith in no way teaches a BoD comprising means for allocating

dynamic resource to VCs. Instead, Smith teaches a broadband switching system comprising a dynamic bandwidth controller (DBC) which is responsible for restricting traffic entering the network according to the bandwidth allocated by its own connection admission control function (CAC) (column 5, line 52). Further, Smith teaches that the DBC requests bandwidth from the respective CAC (column 5, line 57) and the CAC then allocates a bandwidth. This is contrary to that which is taught in the present application, wherein it is the very essence of the invention that the CAC and BoD allocate bandwidth resource. Moreover, Smith teaches that allocation of bandwidth only occurs if sufficient bandwidth is available on the system to allocate a predetermined bandwidth (pre-registered by the customer) to the end system (column 5, line 64). Therefore, Smith teaches the allocation of bandwidth to set up a VC and that allocated bandwidth is not altered for the duration of the connection associated with the VC. The present application is distinct from this as it teaches reallocation of bandwidth to accommodate VCs onto the MA network and to increase the transmission efficiency of VCs which have already been set up on the network. The broad band switching system of Smith is silent in relation to means for allocating static resource and dynamic resource to VCs or groupings of VCs. Furthermore, Smith is also silent in relation to means for reallocating the amount of static resource and/or booked dynamic resource, associated with a set up connection, when new connections are set up or when connections are released within the group. Therefore, in the sense of the present invention, Smith is silent on the allocation of dynamic resource, that is, resource which may be pre-booked and/or allocated or reallocated once the connection has been set up.

It is submitted that independent Claims 1 and 23 of the present invention are allowable over Smith for the above-mentioned reasons and, therefore, as Claims 3,

4, 7 to 11 and 17 to 19 are dependent on Claim 1, and as Claims 24, 25, 29 to 33 and 39 to 41 are dependent on Claim 23, it is submitted that these claims are also allowable over Smith.

Furthermore, in relation to independent Claims 20 and 42, the present invention teaches an integrated CAC and BoD system, and method of integrating a CAC and BoD, additionally comprising an allocation table setting out resource allocation on the MA uplink which is <u>controlled</u> by the <u>CAC</u> when allocating <u>static</u> resource and booking dynamic resource and controlled by the <u>BoD</u> when allocating <u>dynamic</u> resource.

The table advantageously provides an efficient way to integrate CAC and BoD allocation of static and dynamic resource (page 11, line 8).

As stated above, Smith in no way teaches integration of a CAC and BoD and, furthermore, makes no distinction between static and dynamic resource. Smith is silent in relation to a table operable to set out resource allocation for more than one type of resource. Instead, Smith teaches a table for assigning a value for the DBC identity for each VPI/VCI value pair, which is controlled by the CAC only (Smith, column 10, line 58).

It is submitted that independent Claims 20 and 42 are allowable over Smith and, therefore, as Claim 21 is dependent on Claim 20, and Claim 43 is dependent on Claim 42, it is submitted that Claim 21 is also allowable.

Furthermore, in relation to Claims 22 and 44, the present application teaches a method of integrating a CAC and a BoD system in which the CAC and BoD are constrained to allocate resource in such a way that traffic on the common medium axis uplink is shaped by the integrated CAC and BoD resource allocation system.

The shaping of traffic by integration of the CAC and BoD ensures that the traffic entering any head end complies with the constraints of the head end due, in particular to low buffer space. As described on page 23, line 4 of the description of the present application, if the head end has sufficient processing and buffer space then it can itself reshape traffic at its ingress to conform to the requirements for traffic at the ingress of the head end. This means that the CAC and BoD for the uplink can be designed with only maximum utilisation of the common medium uplink in mind, that is, without considering the head end. Therefore, the rate available for best effort in the common medium uplink can be shared among current best effort requests, without considering the impact of this sharing on the congestion in the buffers of the head end.

This is distinct from that which Smith teaches wherein it is only the DBC which controls or "shapes" the traffic fed to the network. Further, Smith teaches control or shaping of the traffic so as to be equal to the current CR applicable to <u>that particular transmission</u>. The present invention differs in that it provides for allocation and reallocation of static and dynamic resource, by the CAC and the BoD, without needing to consider the impact of sharing the resource on the congestion in the buffers and the head end.

The Examiner has also rejected Claims 2, 5, 6, 12, 13, 26 to 28, 34 and 35 under 35 U.S.C.103 (a) as being unpatentable over Smith (US 6,222,823) as applied to Claim 1 in further view of Fan (US 6,408,005). Reconsideration of the rejection is requested, in light of the comments below in which it is submitted that the claims are patentable over a combination of Smith (US 6,222,823) and Fan (US 6,408,005), especially given the significant differences already described between Smith and the present invention.

In the highly unlikely event that a person ordinarily skilled in the art were to consider Smith, as providing the features alleged by the Examiner's interpretations, and also knowing of Fan, it is submitted that a combination of Smith and Fan could not provide an integrated CAC and BoD system, and method of integration thereof, according to the present application. Nevertheless, in the highly unlikely event that a person ordinarily skilled in the art has been aware of the teachings of Smith and Fan, and had been drawn to combine them, the following observations are presented to the Examiner.

As stated above, the present application relates to an integrated connection admission control (CAC) and bandwidth on demand control (BoD) system, and method of integration of a CAC and BoD, for allocating the resource of a common medium uplink of a multiple axis (MA) asynchronous network segment. The CAC comprises means for allocating static resource to all virtual connections (VCs) accepted by the CAC and means for booking dynamic resource to the VCs, or groupings of VCs, that require guaranteed dynamic resource. The BoD comprises means for allocating dynamic resource to VCs, or to groupings of VCs, requesting dynamic resource such that all VCs or groupings of VCs requesting dynamic resource are <u>dynamically allocated</u> requested dynamic resource up to at least the guaranteed dynamic resource which has been booked for them by their CAC.

Smith teaches a broad band switching system comprising a Dynamic Bandwidth Controller (DBC), for <u>controlling</u> traffic entering a network through one or more local switches, and a Connection Admission Controller (CAC) for allocating bandwidth to incoming data.

The present application also teaches groupings of VCs within the same Subscriber Access Unit (SAU). This is advantageous because by allocating the static

resource and booking dynamic resource to a group of VCs within the same SAU, the CAC is able to take advantage of intra SAU multiplexing. Both Smith and Fan are silent on this matter.

Furthermore, the present application teaches that the static resource and dynamic resource may be allocated on a period basis. The allocations made for the next period are dependent on the allocations for the current period. Both Smith and Fan relate to allocation of bandwidth to set up connections (namely static resource, in the sense of the present application) and not the reallocation of bandwidth to connections which have been set up, as taught in the present application. The allocation of bandwidth as described in Fan (col. 11, line 57 to col. 12, line 48) does not relate to static <u>and</u> dynamic resource allocation and reallocation and, therefore, is <u>not</u> relevant to the integrated system as described in the present application.

The present application also teaches allocation of static and dynamic resource to a group of VCs and reallocation of static and dynamic resource to a group of VCs when new connections are set up or connections are released within the group. Fan merely teaches a method of controlling the rate at which cells are transmitted to meet predetermined QoS by allocating available "static" bandwidth on setting up each VC. Both Smith and Fan are silent in relation to allocation of static <u>and</u> dynamic resource and <u>reallocation</u> of <u>dynamic</u> resource to increase the efficiency of the transmission of cells set up on the MA network.

Consequently, bearing in mind the teachings of Smith in view of Fan, a person having ordinary skill in the art of communication systems would clearly have had to perform inventive steps in order to achieve the integrated system as taught in the present application.

In view of the foregoing, it is submitted that the claims distinguish from the references, whether considered alone or in combination, and are therefore allowable thereover. The Examiner's further and favorable reconsideration in that regard is urged.

Respectfully submitted,

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